



# Taking Dogs Into the Office: A Novel Strategy for Promoting Work Engagement, Commitment and Quality of Life

Sophie Susannah Hall\* and Daniel Simon Mills

Animal Behaviour, Cognition and Welfare Group, School of Life Sciences, University of Lincoln, Lincoln, United Kingdom

## OPEN ACCESS

### Edited by:

Nathaniel James Hall,  
Texas Tech University, United States

### Reviewed by:

Andrea Beetz,  
University of Rostock, Germany  
Howard H. Erickson,  
Kansas State University, United States

### \*Correspondence:

Sophie Susannah Hall  
Shall@lincoln.ac.uk

### Specialty section:

This article was submitted to  
Veterinary Humanities and Social  
Sciences,  
a section of the journal  
Frontiers in Veterinary Science

**Received:** 27 February 2019

**Accepted:** 12 April 2019

**Published:** 07 May 2019

### Citation:

Hall SS and Mills DS (2019) Taking  
Dogs Into the Office: A Novel Strategy  
for Promoting Work Engagement,  
Commitment and Quality of Life.  
Front. Vet. Sci. 6:138.  
doi: 10.3389/fvets.2019.00138

Despite growing interest in “take your dog to work” days and the wellbeing benefits associated with interactions with a friendly dog (e.g., animal-assisted activities), there has been little quantification of the benefits of this. We analyzed responses to work-related (work engagement, turnover intention, work-based friendship acuity, social media use, and work-related quality of life) and dog-related (pet dog attachment and dog general health) scales from 749 employees. The predominantly female sample was comprised of 243 employees who brought their dog to work (167 = “often” brought dog to work; 76 = “sometimes” brought dog to work), the remaining 506 did not bring their dog to work. Employees who “often” took their dog to work reported higher than average work engagement on all factors (vigor, dedication, absorption, total), with significant differences reported in comparison to those who “sometimes” (vigor and total) and “never” (vigor, dedication, absorption, total) took their dog to work. Turnover intention was also significantly lower and work-based friendship acuity higher in the group of employees who “often,” compared to “never,” took their dog to work. Benefits of bringing your dog to work were also observed in terms of work-related quality of life, with higher scores on general wellbeing, home-work interface, job career-satisfaction, control at work, working conditions, and overall work quality of life in those who “often” compared to “never” take their dog to work. Employees who “never” took their dog to work reported lower use of social media during break times. We also identified factors which may be important to consider in developing dogs-in-the-workplace policies; dog-demographics including weight (i.e., size), breed-type, and training may be important to consider in defining the ideal office dog and deserve further research. Given the need to improve employee wellbeing and satisfaction to promote effective business performance and economic gain, these results have important implications for office based businesses considering allowing dogs in the workplace.

**Keywords:** dogs, office, quality of life, engagement, work performance

## INTRODUCTION

The evidence in favor of the wellbeing benefits associated with interacting with a pet (typically a dog), has led to a rise in the use of animal-assisted interventions (AAI) in structured visitation programs to organizations (1), such as nursing homes (10, 11), healthcare settings (12–14), and educational institutions (15–17). Historically, dogs in the workplace has typically been limited to

allowing trained assistance dogs public access in office-based buildings, to support their owners who may have visual or hearing difficulties (18, 19), or other medical problems such as diabetes. However, with the rise in interest in the value of pet dogs to human health and wellbeing, in both structured interventions and less structured activities (20–24), there is increasing momentum behind “bring your dog to work days” (25, 26).

Being able to bring your pet dog to work potentially offers some intuitively attractive buffers to support psychological wellbeing. The presence of a companion dog has been shown to reduce owner stress, both in the home environment and when completing a challenging task, such as that which may be experienced in a working office (22, 27–29). These benefits are thought to be realized through the calm, non-judgmental constancy that is provided through the presence of a companion animal and through feelings of increased social support (20). As well as offering a direct source of social support (30, 31), dogs are thought to act as social catalysts, increasing communication and friendships with others (21, 32).

If allowing dogs in the workplace improves work-related quality of life and work relations, this may lead to wider benefits, such as increased employee satisfaction, and thus may prove an attractive option for businesses wishing to improve staff retention, employee satisfaction (3), and relations (33, 34), as well as work related quality-of-life (35). Furthermore, with growing concern that increased use of social media can have a negative effect on wellbeing (36, 37), allowing dogs at work might divert employee attention away from social media activities during break periods, further promoting a positive working environment and colleague relations.

However, the number of businesses which allow dogs in the workplace is still very much a minority and there is a lack of strong scientific data to support the benefits of dogs in the office. Current research in this area focuses almost exclusively on qualitative data relating to perceptions of pets in the workplace, or small scale studies (1, 5, 28, 38–41). This research has identified that dogs in the workplace appear to increase perceptions of positive social interactions and the atmosphere at work, but there is a lack of literature which quantifies its direct and indirect effects (42), especially in relation to measures that might impact on productivity. For example, it might be expected that increased positive colleague interactions and improved work atmosphere may improve working vigor, dedication, and commitment to remaining in the place of employment. Additionally, allowing dogs at work may reduce the stress felt by owners at leaving their dog during working hours (43). Dog owning and non-dog owning employees report increased stress over the working day, yet owners who had their dog with them have been known to report less stress over the day (28). Since work-based stress increases cognitive strain and diminishes motivation and memory processes, reducing employee performance (44) and increasing absenteeism and dysfunction (45), this may also have important implications for productivity. Furthermore, some research has also identified that allowing pets in the workplace is associated with a number of challenges and drawbacks, including health and safety, cultural sensitivities, fears, phobias,

and disruptions to the working environment (2, 41, 46). As such, the perceived benefits of dogs in the workplace may not be actualized. One key factor which has yet to be scientifically investigated, but which may prove important in determining the extent to which dogs in the office is a useful strategy for promoting work-related outcomes, is to identify whether certain dog-based demographics are associated with different outcomes, for example, it may be that small dogs are less distracting than larger dogs.

With the aim of providing a quantitative assessment of the impact of bringing your dog in to the office on work-related outcomes (employee commitment to work, work place wellbeing, and social relations) and dog-related outcomes (pet dog attachment and general dog wellbeing), we conducted an internationally advertised survey of dog-owning employees. It was predicted that dog owners who bring their dog in the office would report greater commitment to work, and have enhanced work place wellbeing and social relations, compared to dog owners who do not bring their dog to the office. We also expected that, if allowing employees to take their dog to the office reduced stress associated with leaving the dog at home unattended, employees who took their dog to work would show lower anxious attachment to their dog than those who did not take their dog to the office. With the secondary aim of identifying whether certain dogs make better working companions than others, we assessed whether certain dog-based demographics were related to better work-related outcomes than others.

## METHODS

### Survey Design

The survey was designed by the study team and sent for critical appraisal to our study steering group, consisting of four employees and employers working in different office environments. The survey comprised of an introduction and consent page, demographic questions pertaining to the participant, their dog and the nature of their office (items and responses are listed in **Table 1**) and whether or not they were allowed to take their dog to work (response: yes, no, not sure). Participants were asked to rate their dogs' general health based on the past 3 months on a 5-point Likert scale (1 = poor health, 5 = has had no health issues), this item was used as a rough guide to provide an initial assessment as to whether dogs who went into offices with their owners showed significantly different general health compared to those that did not. Respondents were not informed as to the rationale behind this question. In the following sections, participants were asked questions relating to work-related quality of life, work engagement, turnover intention, social media use, friendship assessment, and pet dog attachment using the following recognized scales and methods of assessment:

### Work Related Quality-of-Life (47)

This validated, well used 23-item scale was used to assess quality of life at work (48, 49). The scale is comprised of six factors: general wellbeing (6 items), home-work interface (3 items), job career satisfaction (6 items), control at work (3 items), working

**TABLE 1** | Demographic items and responses across employees.

	Don't take dog to work ( <i>n</i> = 506)	Take dog to work sometimes ( <i>n</i> = 76)	Take dog to work often ( <i>n</i> = 167)
<b>Employee age</b>			
		$\chi^2 (10) = 14.38, p > 0.05$	
18–25 years	18% (91)	18.4% (14)	11.4% (19)
26–35 years	34.4% (174)	46.1% (35)	38.3% (64)
36–45 years	20.0% (101)	14.5% (11)	22.2% (37)
46–55 years	20.0% (101)	11.8% (9)	18.6% (31)
56–65 years	7.5% (38)	7.9% (6)	9.6% (16)
66 years and over	0.2% (1)	1.3% (1)	0% (0)
<b>Employee gender</b>			
		$\chi^2 (4) = 1.67, p > 0.05$	
Female	90.9% (460)	88.2% (67)	89.8% (150)
Male	8.9% (45)	11.8% (9)	9.6% (16)
Non-binary	0.2% (1)	0% (0)	0.6% (1)
<b>Area of residence</b>			
		$\chi^2 (8) = 7.59, p > 0.05$	
UK	92.1% (466)	94.7% (72)	91.0% (152)
North America	6.1% (31)	3.9% (3)	4.8% (8)
Central/South America	0% (0)	0% (0)	0% (0)
Republic of Ireland	0% (0)	0% (0)	0.6% (1)
Europe (excluding British Isles)	1.6% (8)	1.3% (1)	3.6% (6)
Africa	0% (0)	0% (0)	0% (0)
Middle East	0% (0)	0% (0)	0% (0)
South Asia	0% (0)	0% (0)	0% (0)
Asia Pacific	0% (0)	0% (0)	0% (0)
Australia/New Zealand	0.2% (1)	0% (0)	0% (0)
<b>Organization type</b>			
		$\chi^2 (10) = 71.56, p < 0.001^*$	
Commercial	31.8% (161)	35.5% (27)	41.9% (70)
Not for profit	10.3% (52)	30.3% (23)	27.5% (46)
Government (inc. armed forces)	10.3% (52)	3.9% (3)	3.6% (6)
Healthcare	9.5% (48)	6.6% (5)	4.2% (7)
Education	31.8% (161)	13.2% (10)	15.0% (25)
Other	6.3% (32)	10.5% (8)	7.8% (13)
<b>Hours in office (typical week)</b>			
		$\chi^2 (8) = 14.19, p > 0.05$	
0–1	5.5% (28)	7.9% (6)	10.2% (17)
1–10	10.7% (54)	13.2% (10)	12.0% (20)
11–20	18.6% (94)	10.5% (8)	20.4% (34)
21–30	64.6% (327)	65.8% (50)	57.5% (96)
31 plus	0.6% (3)	2.6% (2)	0% (0)
<b>Length in current employment</b>			
		$\chi^2 (12) = 23.21, p < 0.03^*$	
<6 months	9.5% (48)	2.6% (2)	3% (5)
6 months–1 year	12.5% (63)	13.2% (10)	9.6% (16)
1–3 years	25.7% (130)	25.0% (19)	25.7% (43)
3–6 years	19.2% (97)	27.6% (21)	16.2% (27)
6–9 years	7.5% (38)	5.3% (4)	13.2% (22)
9–12 years	9.5% (48)	6.6% (5)	11.4% (19)
Over 12 years	16.2% (82)	19.7% (15)	21.0% (35)
<b>People in office (typical day)</b>			
		$\chi^2 (10) = 44.62, p < 0.001^*$	
Only me	5.5% (28)	2.6% (2)	10.8% (18)
2 people	19.4% (98)	35.5% (27)	31.7% (53)
3–5 people	15.2% (77)	17.1% (13)	15.6% (26)
6–10 people	10.5% (53)	15.8% (12)	8.4% (14)
11–20 people	43.7% (221)	27.6% (21)	24.0% (40)
21 plus people	5.7% (29)	1.3% (1)	9.6% (16)

(Continued)

TABLE 1 | Continued

	Don't take dog to work ( <i>n</i> = 506)	Take dog to work sometimes ( <i>n</i> = 76)	Take dog to work often ( <i>n</i> = 167)
<b>Dog age</b>		$\chi^2 (12) = 12.66, p > 0.05$	
<6 months	3.0% (15)	0% (0)	1.2% (0)
6 months–1 year	8.3% (42)	7.9% (6)	10.2% (17)
1–2 years	20.0% (101)	26.3% (20)	25.7% (43)
3–5 years	30.0% (152)	27.6% (21)	31.7% (53)
6–8 years	19.6% (99)	17.1% (13)	12.6% (21)
9–11 years	12.5% (63)	13.2% (10)	14.4% (24)
12 years plus	6.7% (34)	7.9% (6)	4.2% (7)
<b>Dog length owned</b>		$\chi^2 (12) = 7.00, p > 0.05$	
<6 months	6.9% (35)	6.6% (5)	7.8% (13)
6 months–1 year	9.1% (46)	9.2% (7)	14.4% (24)
1–2 years	22.3% (113)	22.4% (17)	23.4% (39)
3–5 years	29.8% (151)	35.5% (27)	27.5% (46)
6–8 years	16.6% (84)	13.2% (10)	13.8% (23)
9–11 years	10.3% (52)	10.5% (8)	9.6% (16)
12 years plus	4.9% (25)	2.6% (2)	3.6% (6)
<b>Dog sex and neuter status</b>		$\chi^2 (6) = 6.32, p > 0.05$	
Female–entire	12.8% (65)	18.4% (14)	10.8% (18)
Female–neutered	30.4% (154)	28.9% (22)	33.5% (56)
Male–entire	17.6% (89)	15.8% (12)	22.8% (38)
Male–neutered	39.1% (198)	36.8% (28)	32.9% (55)
<b>Dog breed type</b>		$\chi^2 (4) = 0.42, p > 0.05$	
Single (pure) breed	64.8% (328)	64.5% (49)	67.1% (112)
Single cross (e.g., Labrador × Poodle)	20.8% (105)	19.7% (15)	19.2% (32)
Mixed–multiple crosses	14.4% (73)	15.8% (12)	13.8% (23)
<b>Dog training</b>		$\chi^2 (26) = 45.98, p < 0.01^*$	
General obedience (GO)	38.9% (197)	36.8% (28)	33.5% (56)
Kennel club (KC)	2.6% (13)	5.3% (4)	3.0% (5)
Agility (Ag)	0.6% (3)	1.3% (1)	3.0% (5)
Working dog (WD) <sup>a</sup>	1.0% (5)	1.3% (1)	4.2% (7)
Assistance dog (AD)	0% (0)	1.3% (1)	3.0% (5)
Other	1.6% (8)	2.6% (2)	2.4% (4)
None	31.6% (160)	28.9% (22)	26.3% (44)
GO + KC + Ag <sup>b</sup>	2.4% (12)	0% (0)	4.2% (7)
GO + Ag	7.7% (39)	6.6% (5)	9.0% (15)
GO + Ag + WD	1.6% (8)	3.9% (3)	2.4% (4)
GO + WD	3.6% (18)	2.6% (2)	3.6% (6)
GO + KC	7.1% (36)	5.3% (4)	4.8% (8)
AD + Other	0.6% (3)	2.6% (2)	3.6% (6)
KC + Ag	0.8% (4)	1.3% (1)	0% (0)
<b>Dog weight category</b>		$\chi^2 (6) = 6.24, p > 0.05$	
<5kg	7.9% (40)	3.9% (3)	9.0% (15)
6–10kg	24.7% (125)	19.7% (15)	20.4% (34)
11–20 kg	29.2% (148)	36.8% (28)	35.9% (60)
21 kg plus	38.1% (193)	39.5% (30)	34.7% (58)

\*Significant chi square test results are discussed in the results section.

<sup>a</sup>Working dog training (e.g., shepherding and gun dog work).

<sup>b</sup>Categories were recoded to combine training where more employees selected more than one option to ensure each item was mutually exclusive.

conditions (3 items) stress at work (2 items), and total work-related quality of life. Participants answered each question on a 5-point scale (strongly disagree = 1 to strongly agree = 5).

Three items are negatively phrased and therefore reverse coded (questions 7, 9, 19). Higher scores indicate greater perceived quality of working life.

### Utrecht Work Engagement Scale (50, 51)

This validated 9-item scale, comprised of three factors (52, 53), was used to assess employee vigor (3 items), dedication (3 items) and absorption to work (3 items), as well as total work engagement. Participants responded to each item using a 7-point scale (never = 0, always/every day = 6). Mean scores are computed to derive scale scores and total scores, higher scores are indicative of greater work engagement.

### Turnover Intention Scale (54)

This 6-item scale, with documented reliability and validity (54, 55) evaluates an employee's desire to leave their current job. Participants responded to each item using a 5-point scale (never = 1, always = 5). One item is reverse scored, item scores are added to provide a single total score, higher scores are indicative of greater intention to leave current place of employment.

### Friendship Assessment Scale (56)

This 6-item scale, with documented validity and reliability (56, 57), was used to assess social support/isolation typically felt at work. Respondents were instructed to consider each item in relation to the past 4 weeks. Items are scored on a 5-point scale (almost always = 0, never = 4), with three items being reverse scored. Higher scores indicate greater friendship acuity. To ensure the scale measured friendships within the workplace, minor amendments were made to the wordings of each item. The amendments are presented in italics: (1) It has been easy to relate to others *in the office*, (2) I felt isolated from other people *in the office*, (3) I had someone to share my feelings with *at work*, (4) I found it easy to get in touch with others *at work*, (5) When with other people *in the office*, I felt separate from them, (6) I felt alone and friendless *at work*. To ensure these minor changes to the item wording did not affect scale reliability Cronbach alphas were computed ( $\alpha = 0.87$ ) and compared to those reported in the original scale development [ $\alpha = 0.83$ ; (56)]; scores indicated similar, excellent reliability with the minor word changes.

### Social Media Use

To assess total amount of time spent using social media (e.g., Facebook, Twitter, Instagram) for non-work activities, we asked participants to approximate the number of minutes spent using these media platforms through three questions; *During break times at work*: (1) Approximately how many minutes do you spend using social media (e.g., Twitter, Facebook, Instagram) for non-work activities on an average day, whilst in the office, but during break times? *During home time*: (2) Approximately how many minutes do you spend using social media (e.g., Twitter, Facebook, Instagram) for non-work activities on an average day, whilst NOT in the office (e.g., at home)? *During work time*: (3) Approximately how many minutes do you spend using social media (e.g., Twitter, Facebook, Instagram) for non-work activities during an average day, during work time (i.e., not during break times)? Participants responded on a 5-point scale (I don't use social media = 0, over 2 h = 4).

### Pet Attachment Questionnaire (58)

To assess the bond between the owner and their dog we used this validated 26-item scale, comprised of two factors; avoidant and anxious pet attachment. Participants were instructed to answer the questions in relation to their dog. If they owned more than one dog, they were asked to select the dog that they felt the closest to. Items are scored on a 7-point scale (disagree strongly = 1, agree strongly = 7), one item is reverse scored (on the avoidant dimension). Item scores are summed together, higher scores are indicative of greater anxious or avoidant pet attachment.

## Participants and Recruitment

Participants were recruited via press releases, social media and through the University of Lincoln's database of dog owners. The study was carried out in accordance with the recommendations of the British Psychological Society (BPS) Ethical Code of Conduct, with written informed consent from all subjects. All subjects gave written informed consent in accordance with the Declaration of Helsinki. The protocol was approved by the University of Lincoln's College of Science Research Ethics Committee (ID: CoSREC367).

Study advertisements informed that we were interested in understanding the impact of dog ownership on employees and we were looking for dog-owning employees, who currently owned a pet dog and worked in an office environment, to take part in a short survey. For the purpose of the survey, we provided a definition of office as: "a room, set of rooms, or building used for commercial, professional or bureaucratic work. We include teachers working in a school in this definition." Advertisements specified that we were interested in hearing from employees who did and did not take their dog to work. The opportunity to enter a prize draw for a £50 voucher was offered upon completion of the survey. Interested participants were directed to the survey, hosted via Qualtrics. Recruitment started on 2nd March 2018 and the survey closed on 5th September 2018. A total of 1,055 surveys were started, but 302 did not complete the initial study confirmation statements (I am 18 years or older, I currently own a pet dog, I currently work in an office environment, I visit the office at least once a week, I am aware my responses will be kept confidential and I can contact the research team if I have any questions) (analysis  $n = 749$ ).

## Analysis

Since the aim of the study was to explore the impact of bringing pet dogs in the office, not the impact of allowing dogs in the office, for the first stage of the analysis responses were grouped into those who "never," "sometimes," and "often" took their dog to work, rather than those who were allowed to take their dog to work. We first examined participant characteristics between the three "dogs at work" groups ("never," "sometimes," "often") using Chi Square analyses (with Fishers Exact tests where necessary). We examined standardized residuals and adjusted standardized residuals relative to a cut-off point of  $>2$  standard deviations to determine where differences were greatest (7).

Secondly, we assessed whether there was a significant difference in a number of work-related outcomes between employees who took their dog in to the office "often,"



“sometimes,” or “never” using univariate or multivariate ANOVAs as appropriate, with Bonferroni corrected *post-hoc* comparisons as necessary. The same approach was used in the third stage of the analysis, which explored significant differences in dog-related outcomes between the three dogs at work groups. In the final stage of the analysis we assessed whether some employees experienced significantly better work-related outcomes than others based upon factors relating to the dog (age, breed-type, gender, length owned, training, and weight) using ANOVAs. Due to the comparably smaller sample size in the number of people who “sometimes” took their dog to work, the categories of “sometimes” and “often” were collapsed to create one group of employees who took their dog to work.

## RESULTS

### Participant Demographics

From the 749 responses, 415 selected that they were not allowed to bring their dog to work (55.4%), 31 of the 274 employees who selected that they were allowed to bring their dog to work indicated they did not bring the dog to work, and 60 selected that they were not sure as they didn't bring their dog to work, these form the “never” group ( $n = 506$ ). Out of the 274 employees who were allowed to bring their dog to work (36.6% of the sample), 243 (88.7% of those allowed) brought their dog to work, with 167 employees “often” (between once a week to every day) bringing their dog, this formed the “often” group, and 76 “sometimes” (between once a month to a few times a month) bringing their dog to work, this formed the “sometimes” group.

Females, residing in the UK, were the greatest responders to the survey (Table 1). The most frequently represented age category was 26–35 year olds, who worked for commercial organizations. The majority of employees worked 21–30 h in the office on a typical week and had been in their current place of employment for between 1 and 3 years.

The significance of associations between taking your dog to work and demographic factors are reported in Table 1, where we report the standardized and adjusted residuals for the tests which were statistically significant.

### Organization Type

Significantly more people than expected take their dog to work if they work for a not-for-profit organization and less people than expected take their dog to work if they are employed in the education sector. Indeed, the number of employees who “never” take their dog to work were fewer than expected in not-for-profit organizations (standardized residual:  $-3.3$ ; adjusted residual:  $-6.3$ ) and higher than expected in education (standardized residual:  $2.5$ ; adjusted residual:  $5.1$ ). Employees who “sometimes” take their dog were greater than expected in not-for-profit organizations (standardized residual:  $3.1$ ; adjusted residual:  $3.5$ ) and lower than expected in education (standardized residual:  $-2.2$ ; adjusted residual:  $-2.7$ ). Additionally, the number of employees who “often” take their dog were greater than expected in those working for not-for-profit organizations (standardized residual:  $3.7$ ; adjusted residual:  $4.5$ ) and lower in education (standardized residual:  $-2.8$ ; adjusted residual:  $-3.7$ ).

### Length in Current Employment

Working in the current place of employment for <6-months was associated with significantly lower than expected counts of “often” taking your dog to work (standardized residual:  $-2.1$ ; adjusted residual:  $-2.4$ ), whereas working in the current place of employment for 6–9 years was associated with higher than expected counts of “often” taking your dog to work (standardized residual:  $2.0$ ; adjusted residual:  $2.4$ ).

### Number of People in the Office

Bringing your dog to work regularly was significantly associated with working in smaller offices (fewer employees). The number of employees who “never” bring their dog to work were lower than expected if 2 people are in the office (standardized residual:  $-2.0$ ; adjusted residual:  $-4.1$ ), and higher than expected if 11–20 people work in the office (standardized residual:  $2.2$ ; adjusted residual:  $4.9$ ). Employees who “often” bring their dog to work were greater than expected if 1 (standardized residual:  $2.2$ ; adjusted residual:  $2.6$ ), and 2 people (standardized residual:  $2.1$ ; adjusted residual:  $2.7$ ) worked in the office and lower than expected if 11–20 people (standardized residual:  $-2.9$ ; adjusted residual:  $-4.1$ ) worked in the office.

### Dog Training

Bringing your dog to work regularly may be associated with having a dog that has received assistance dog training and working dog training (e.g., shepherding or gun dog work). Employees who “never” took their dog to work had significantly lower than expected counts for their dog receiving assistance dog training (standardized residual:  $-2.0$ ; adjusted residual:  $-3.5$ ). However, there were no clear associations for “sometimes” and “often.” Employees who “often” took their dog to work had higher than expected counts for their dog receiving working dog training (standardized residual:  $2.4$ ; adjusted residual:  $2.8$ ), although there were no clear associations for “sometimes” and “never.”

### Work-Related Outcomes

In the second stage of the analysis we assessed differences in work-related outcomes between the three dogs at work groups to evaluate the impact of bringing your dog to work on perceived work engagement, turnover intention, work-based friendships, use of social media, and work-related quality of life. Descriptive statistics and, where possible, comparison to norm scores are presented in Table 2. It should be pointed out, that whilst norm scores are computed based on a sample in which males and females were similarly represented, our sample is predominately female.

### Work Engagement

There was a significant difference in work engagement across the three “dogs at work” groups, in terms of:

Vigor:  $F_{(2,746)} = 22.81$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.058$ , being significantly higher in individuals who “often” ( $p < 0.001$ ) and “sometimes” ( $p = 0.02$ ) took their dog to work, compared to those who “never” took their dog to work.

**TABLE 2 |** Descriptive statistics for work engagement, work-related quality of life (QoL), turnover intention, friendship acuity and social media use, and pet dog attachment, across the three dogs at work groups, including comparison to norm scores.

	Never ( <i>n</i> = 506)	Sometimes ( <i>n</i> = 76)	Often ( <i>n</i> = 167)	Norm data
<b>Work engagement</b>			Mean ± SEM	
Vigor	3.05 ± 0.06	3.51 ± 0.15	3.87 ± 0.10	4.01 ± 0.01*
Dedication	3.75 ± 0.07	4.09 ± 0.15	4.52 ± 0.09	3.88 ± 0.01
Absorption	3.75 ± 0.06	4.09 ± 0.14	4.47 ± 0.08	3.35 ± 0.01
Total	3.52 ± 0.06	3.91 ± 0.13	4.28 ± 0.08	3.74 ± 0.01
<b>Work related QoL</b>				
General well-being	3.47 ± 0.03	3.69 ± 0.08	3.79 ± 0.05	3.62 ± 0.02**
Home-work interface	3.39 ± 0.04	3.70 ± 0.10	4.00 ± 0.06	3.48 ± 0.03
Job-career satisfaction	3.61 ± 0.03	3.79 ± 0.08	3.96 ± 0.05	3.50 ± 0.03
Control at work	3.34 ± 0.04	3.66 ± 0.09	4.00 ± 0.05	3.43 ± 0.03
Working conditions	3.82 ± 0.03	3.95 ± 0.08	4.21 ± 0.04	3.45 ± 0.03
Stress at work	2.55 ± 0.04	2.75 ± 0.13	2.75 ± 0.07	2.69 ± 0.03
Overall work QoL	3.52 ± 0.04	3.78 ± 0.10	4.02 ± 0.07	3.44 ± 0.02
<b>Turnover intention</b>	17.82 ± 0.19	16.96 ± 0.53	15.19 ± 0.35	max score 75
<b>Friendship acuity</b>	17.08 ± 0.24	19.35 ± 0.47	19.19 ± 0.41	<15 = low, >19 = high
<b>Social media use</b>				
During work	1.00 ± 0.04	1.26 ± 0.12	1.17 ± 0.08	n/a
During breaks	1.17 ± 0.03	1.38 ± 0.11	1.35 ± 0.06	n/a
At home	2.54 ± 0.04	2.63 ± 0.12	2.68 ± 0.08	n/a
<b>Pet dog attachment</b>				
Anxious	35.40 ± 0.51	36.26 ± 1.33	32.37 ± 0.89	n/a
Avoidant	17.95 ± 0.24	17.49 ± 0.61	17.14 ± 0.41	n/a
<b>Dog health score</b>	4.23 ± 0.40	4.24 ± 0.10	4.35 ± 0.07	5 = No health issues

\*(59), *n* = 9,679; \*\*(60), *n* = 3,797.

Dedication:  $F_{(2,746)} = 19.18$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.049$ , being significantly higher in those who “often” took their dog to work compared to “never” ( $p < 0.001$ ).

Absorption:  $F_{(2,746)} = 19.03$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.049$ , being significantly higher in those who “often” took their dog to work compared to “never” ( $p < 0.001$ ).

Total work engagement:  $F_{(2,746)} = 24.46$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.062$ , which was significantly higher in those who often ( $p < 0.001$ ) and “sometimes” ( $p < 0.04$ ) took their dog to work, compared to “never.”

Comparison of our data, based on a mainly female sample, to normed data, based on male and female samples, showed that for employees who “never” and “sometimes” took their dog to work, vigor, dedication, absorption, and total work engagement scores fell in the “average” category (Table 2). For employees who “often” took their dog to work, levels of absorption fell in the “high” category, levels of vigor, dedication and total work engagement were classed as “average” (59).

### Turnover Intention

There was a significant difference in turnover intention between the three “dogs at work” groups  $F_{(2,746)} = 21.61$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.055$ . Those who “often” took their dog to work had significantly lower intentions to leave than those who “sometimes” ( $p < 0.02$ )

and “never” took their dog to work ( $p < 0.01$ ). Although it was not possible to compare scores to normed data for this scale, given a maximum possible score of 75, the average for each group seemed to indicate that turnover intentions could be considered low in all groups (see Table 2).

### Friendship Acuity

There was a significant difference in friendship acuity between the three “dogs at work” groups  $F_{(2,746)} = 14.05$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.036$ . Those who “often” took their dog to work reported significantly higher friendship acuity than those who “never” took their dog to work ( $p < 0.01$ ). Normed data have not been reported for this scale, however, scoring guidelines suggest that employees who “sometimes” and “often” bring their dogs to work have high work-based friendship acuity, whereas employees who “never” take their dog to work have more typical friendship acuity (Table 2).

### Social Media Use

There was no significant difference in frequency of social media use during work hours  $F_{(2,746)} = 3.04$ ,  $p = 0.05$ ,  $\eta_p^2 = 0.008$ , or when at home  $F_{(2,746)} = 1.11$ ,  $p = 0.33$ ,  $\eta_p^2 = 0.003$ , between the three “dogs at work” groups. However, there was a significant difference in social media use during break time at work  $F_{(2,746)} = 4.68$ ,  $p = 0.01$ ,  $\eta_p^2 = 0.012$ . In contrast

**TABLE 3 |** Descriptive statistics for work engagement in employees who take their dog to their office as a function of dog-based demographics.

	Vigor	Dedication	Absorption	Total
<b>Dog factors</b>	(Mean ± SEM)			
<b>Age</b>				
<6 months	2.85 ± 0.93	4.15 ± 0.91	3.65 ± 0.78	3.55 ± 0.80
6 months–1 year	3.26 ± 0.27	4.01 ± 0.26	4.24 ± 0.23	3.83 ± 0.23
1–2 years	3.97 ± 0.16	4.41 ± 0.16	4.54 ± 0.14	4.31 ± 0.14
3–5 years	3.76 ± 0.15	4.33 ± 0.15	4.16 ± 0.12	4.09 ± 0.13
6–8 years	3.72 ± 0.22	4.55 ± 0.22	4.30 ± 0.19	4.19 ± 0.19
9–11 years	3.65 ± 0.23	4.49 ± 0.22	4.43 ± 0.19	4.20 ± 0.19
12 years plus	3.95 ± 0.36	4.58 ± 0.35	4.65 ± 0.31	4.39 ± 0.31
<b>Breed type</b>				
Single breed	3.69 ± 0.10	4.35 ± 0.10	4.32 ± 0.08	4.12 ± 0.08
Single cross	3.83 ± 0.19	4.46 ± 0.18	4.43 ± 0.16	4.24 ± 0.16
Mixed	3.94 ± 0.22	4.44 ± 0.21	4.38 ± 0.18	4.25 ± 0.19
<b>Sex and neuter status</b>				
Female entire	3.98 ± 0.23	4.64 ± 0.22	4.67 ± 0.19	4.43 ± 0.19
Female neutered	3.76 ± 0.15	4.32 ± 0.14	4.30 ± 0.12	4.14 ± 0.12
Male entire	3.56 ± 0.18	4.11 ± 0.18	4.17 ± 0.15	3.94 ± 0.15
Male neutered	3.77 ± 0.14	4.51 ± 0.14	4.37 ± 0.12	4.23 ± 0.12
<b>Length owned</b>				
<6 months	3.68 ± 0.31	4.44 ± 0.30	4.35 ± 0.26	4.35 ± 0.26
6 months–1 year	3.38 ± 0.23	4.07 ± 0.23	4.29 ± 0.19	4.29 ± 0.19
1–2 years	3.98 ± 0.17	4.37 ± 0.17	4.53 ± 0.14	4.53 ± 0.14
3–5 years	3.66 ± 0.15	4.30 ± 0.15	4.10 ± 0.12	4.10 ± 0.12
6–8 years	3.85 ± 0.22	4.64 ± 0.22	4.40 ± 0.19	4.41 ± 0.19
9–11 years	3.54 ± 0.26	4.45 ± 0.26	4.42 ± 0.22	4.42 ± 0.22
12 years plus	4.80 ± 0.46	5.12 ± 0.45	5.07 ± 0.39	5.07 ± 0.39
<b>Training</b>				
General obedience (GO)	3.66 ± 0.14	4.43 ± 0.13	4.33 ± 0.12	4.15 ± 0.12
Kennel club (KC)	3.88 ± 0.44	4.01 ± 0.42	4.38 ± 0.37	4.08 ± 0.37
Assistance dog (AD)	3.33 ± 0.53	4.10 ± 0.52	3.73 ± 0.46	3.73 ± 0.46
Agility (Ag)	3.70 ± 1.31	4.70 ± 1.27	3.70 ± 1.12	4.00 ± 1.12
Working dog (WD)	4.32 ± 0.46	4.79 ± 0.52	4.63 ± 0.40	4.58 ± 0.40
Other	4.10 ± 0.53	4.95 ± 0.15	4.88 ± 0.46	4.65 ± 0.46
None	3.71 ± 0.16	4.27 ± 0.48	4.31 ± 0.14	4.10 ± 0.14
GO + KC + Ag	4.55 ± 0.49	5.20 ± 4.81	4.77 ± 0.42	4.84 ± 0.43
GO + Ag	4.27 ± 0.29	4.87 ± 0.28	4.74 ± 0.25	4.62 ± 0.25
GO + Ag + WD	3.38 ± 0.49	3.74 ± 0.48	4.04 ± 0.42	3.71 ± 0.43
GO + WD	4.20 ± 0.46	4.83 ± 0.45	4.36 ± 0.40	4.48 ± 0.40
GO + KC	3.10 ± 0.38	3.76 ± 0.36	4.00 ± 0.32	3.63 ± 0.32
AD + Other	3.41 ± 0.46	3.96 ± 0.45	4.25 ± 0.40	3.89 ± 0.40
KC + Ag	2.70 ± 1.31	4.00 ± 1.27	4.30 ± 1.12	3.70 ± 1.12
<b>Weight</b>				
<5kg	4.35 ± 0.031	4.94 ± 0.30	4.94 ± 0.26	4.76 ± 0.26
6–10 kg	3.56 ± 0.19	4.30 ± 0.18	4.17 ± 0.16	4.02 ± 0.16
11–20 kg	3.93 ± 0.14	4.53 ± 0.14	4.49 ± 0.12	4.32 ± 0.12
21 kg plus	3.57 ± 0.14	4.18 ± 0.14	4.19 ± 0.12	3.98 ± 0.12

to what may be expected, *post-hoc* comparisons revealed that those who “never” took their dog to work used social media less in break times than those who “often” took their dog to work ( $p = 0.03$ , **Table 2**).

### Work-Related Quality of Life

There was a significant difference in work-related quality of life across the three “dogs at work” groups. This was evidenced across the work-related quality of life factors:



**TABLE 4 |** Descriptive statistics for social media use, friendship acuity and turnover intention, in employees who take their dog to their office as a function of dog-based demographics.

	Social media used in breaks	Friendship acuity	Turnover intention
(Mean ± SEM)			
<b>Dog factors</b>			
<b>Age</b>			
<6 months	1.50 ± 0.61	16.50 ± 3.48	16.00 ± 3.30
6 months–1 year	1.43 ± 0.18	18.57 ± 1.03	16.09 ± 0.97
1–2 years	1.41 ± 0.11	19.98 ± 0.62	15.60 ± 0.59
3–5 years	1.57 ± 0.10	18.62 ± 0.57	15.73 ± 0.54
6–8 years	1.12 ± 0.15	20.18 ± 0.84	15.32 ± 0.80
9–11 years	1.18 ± 0.15	19.44 ± 0.84	15.50 ± 0.80
12 years plus	1.00 ± 0.24	17.85 ± 1.37	17.62 ± 1.30
<b>Breed type</b>			
Single breed	1.46 ± 0.07	19.34 ± 0.39	15.93 ± 0.37
Single cross	1.30 ± 0.13	18.53 ± 0.72	15.19 ± 0.68
Mixed	1.03 ± 0.15	19.77 ± 0.83	15.66 ± 0.79
<b>Sex and neuter status</b>			
Female entire	1.56 ± 0.15	19.31 ± 0.88	16.41 ± 0.82
Female neutered	1.29 ± 0.10	19.45 ± 0.56	15.19 ± 0.52
Male entire	1.54 ± 0.12	19.18 ± 0.70	15.16 ± 0.65
Male neutered	1.25 ± 0.10	19.06 ± 0.54	16.36 ± 0.51
<b>Length owned</b>			
<6 months	0.94 ± 0.20	19.72 ± 1.16	15.78 ± 1.10
6 months–1 year	1.35 ± 0.15	19.19 ± 0.88	15.74 ± 0.84
1–2 years	1.52 ± 0.11	20.09 ± 0.66	15.95 ± 0.63
3–5 years	1.56 ± 0.10	18.26 ± 0.58	15.86 ± 0.55
6–8 years	1.09 ± 0.15	19.33 ± 0.86	15.73 ± 0.82
9–11 years	1.29 ± 0.18	19.17 ± 1.00	15.46 ± 0.96
12 years plus	0.88 ± 0.30	21.15 ± 1.74	14.13 ± 1.66
<b>Training</b>			
General obedience (GO)	1.39 ± 0.10	19.52 ± 0.54	15.56 ± 0.49
Kennel club (KC)	1.33 ± 0.29	18.56 ± 1.64	14.89 ± 1.51
Assistance dog (AD)	0.67 ± 0.36	16.00 ± 2.01	19.33 ± 1.85
Agility (Ag)	1.00 ± 0.88	22.00 ± 4.93	9.00 ± 4.52
Working dog (WD)	1.00 ± 0.31	19.75 ± 1.74	15.13 ± 1.60
Other	1.00 ± 0.36	21.50 ± 2.01	14.67 ± 1.85
None	1.53 ± 0.11	19.20 ± 0.61	16.23 ± 0.56
GO + KC + Ag	1.57 ± 0.33	19.57 ± 1.86	12.29 ± 1.71
GO + Ag	1.10 ± 0.20	19.30 ± 1.10	14.65 ± 1.01
GO + Ag + WD	1.43 ± 0.33	19.57 ± 1.86	21.43 ± 1.71
GO + WD	1.75 ± 0.31	20.63 ± 1.74	14.50 ± 1.60
GO + KC	1.25 ± 0.25	19.42 ± 1.42	15.67 ± 1.31
AD + Other	1.25 ± 0.31	14.63 ± 1.74	15.75 ± 1.60
KC + Ag	1.00 ± 0.88	22.00 ± 4.93	21.00 ± 4.52
<b>Weight</b>			
<5kg	1.61 ± 0.21	19.50 ± 1.15	14.83 ± 1.10
6–10 kg	1.45 ± 0.13	19.86 ± 0.70	15.98 ± 0.67
11–20 kg	1.36 ± 0.09	19.84 ± 0.52	15.84 ± 0.50
21 kg plus	1.27 ± 0.09	18.25 ± 0.52	15.70 ± 0.50

General wellbeing:  $F_{(2,746)} = 13.25$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.034$ , with *post-hoc* comparisons revealing significantly higher scores in those who “often” compared to “never” took their dog to work ( $p < 0.001$ ). Mean scores in our predominately

female sample, were similar to normed data, based on male and female samples, across the groups (Table 2).

Home-work interface:  $F_{(2,746)} = 30.11$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.075$ , with significantly higher scores in those who “often” compared to “sometimes” ( $p < 0.05$ ) and “never” took their dog to work ( $p < 0.02$ ) and higher scores in those who “sometimes” compared to “never” took their dog to work ( $p < 0.02$ ). Comparison of means revealed scores on home-work interface in employees who took their dog to work were higher than the norm (based on male and female samples), with employees who “often” took their dog to work falling in the upper 75th percentile.

Job and career satisfaction:  $F_{(2,746)} = 16.47$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.042$ , with significantly higher scores in those who “often” compared to “never” took their dog to work ( $p < 0.001$ ). Mean scores were higher than the male and female normed data for our predominately female employees who “sometimes” and “often” took their dog to work.

Control at work:  $F_{(2,746)} = 41.47$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.100$ , with significantly higher scores in those who “often” compared to “sometimes” ( $p < 0.01$ ) and “never” took their dog to work ( $p < 0.01$ ) and higher scores in those who “sometimes” compared to “never” took their dog to work ( $p < 0.01$ ). Mean scores were higher than the male and female normed data for our mainly female employees who “sometimes” and “often” took their dog to work.

Working conditions:  $F_{(2,746)} = 22.53$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.057$ , with significantly higher scores in those who “often” compared to “sometimes” ( $p < 0.01$ ) and “never” took their dog to work ( $p < 0.01$ ). There was no statistically significant difference between “sometimes” and “never,” although mean scores were higher than the norm for employees who “sometimes” and “often” took their dog to work; employees who “often” took their dog to work falling in the upper 75th percentile.

Stress at work:  $F_{(2,746)} = 3.30$ ,  $p < 0.04$ ,  $\eta_p^2 = 0.009$ , however, *post-hoc* comparisons failed to identify statistically significant differences between the three groups and mean scores were similar to normed data across the groups. As such this result is not considered a significant finding.

Overall work quality of life:  $F_{(2,746)} = 19.98$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.051$ , being significantly higher in those who “often,” compared to “never,” took their dog to work ( $p < 0.01$ ). Mean scores were higher than the norm (based on male and female samples) for the employees in this study who “sometimes” and “often” took their dog to work, with employees who “often” took their dog to work falling in the upper 80th percentile.

## Dog-Related Outcomes Pet Dog Attachment

There was a significant difference in anxious attachment to the pet dog between the three “dogs at work” groups,  $F_{(2,746)} = 4.93$ ,  $p < 0.01$ ,  $\eta_p^2 = 0.013$ . As predicted, those who “often” took their dog to work showed significantly lower anxious attachment than those who “sometimes” ( $p < 0.05$ ) and “never” took their dog to work ( $p < 0.02$ , Table 2). There was no statistically significant

difference in avoidant attachment,  $F_{(2,746)} = 1.53$ ,  $p > 0.05$ , between the groups.

### Dog Health Issues

There was no significant difference in self-reported dog health scores between employees who “never,” “sometimes,” and “often” took their dog to work  $F_{(2,746)} = 1.20$ ,  $p > 0.05$ . Mean scores across the three groups were close to 5 (no health issues) (Table 2).

## The Impact of Dog Demographics on Work-Related Outcomes

### Work Engagement

Dog weight significantly affected work engagement for employees who took their dog to work. Both “absorption”  $F_{(3,242)} = 3.29$ ,  $p = 0.02$ ,  $\eta_p^2 = 0.04$ , and “total” work engagement  $F_{(3,242)} = 3.42$ ,  $p = 0.02$ ,  $\eta_p^2 = 0.04$ , were significantly higher in employees who owned a  $\leq 5$  kg ( $n = 18$ ) dog compared to a  $\geq 21$  kg dog ( $n = 88$ ) ( $ps < 0.05$ ) (see Table 3). Dog weight also significantly affected “vigour”  $F_{(3,242)} = 2.76$ ,  $p = 0.04$ ,  $\eta_p^2 = 0.03$ , *post-hoc* comparisons revealed a similar trend to that with “absorption” and “total” work engagement, but Bonferroni comparisons did not identify specific significant differences.

### Turnover Intention

One dog-based factor, dog training, significantly affected turnover intention for employees who took their dog to work,  $F_{(13,242)} = 2.01$ ,  $p = 0.02$ ,  $\eta_p^2 = 0.10$ . Turnover intention was higher if the dog had received general obedience training combined with agility and working dog training ( $n = 7$ ) compared to employees whose dog had received general obedience training combined with agility and Kennel Club training ( $n = 7$ ) ( $p < 0.01$ ) (see Table 4), although it should be noted the sample size in these sub-groups is small.

### Friendship Acuity

Dog-based factors did not significantly affect friendship acuity (see Table 4).

### Social Media Use

Two dog-based factors significantly affected self-reported use of social media during break times for employees who took their dog to work, including dog breed  $F_{(2,242)} = 3.73$ ,  $p < 0.03$ ,  $\eta_p^2 = 0.03$ , and length of time dog owned  $F_{(6,242)} = 2.67$ ,  $p < 0.02$ ,  $\eta_p^2 = 0.06$ . Owners of mixed breed dogs ( $n = 35$ ) spent significantly less time using social media during break time than owners of single (pure) breed dogs ( $n = 161$ ) ( $p < 0.03$ ) (see Table 4). *Post hoc* comparisons with the length of time dog owned were not significant, but there appeared to be a possible trend toward lower use of social media the longer the dog had been owned.

### Work Related Quality of Life

Dog weight significantly affected facets of work-related QoL, including work conditions  $F_{(3,242)} = 3.89$ ,  $p < 0.01$ ,  $\eta_p^2 = 0.05$ , and overall work QoL  $F_{(3,242)} = 4.01$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.05$ , with significantly higher QoL for employees who took their dog to work if the dog was smaller (5 kg;  $n = 18$ ) compared to larger (21 kg;  $n = 88$ ) ( $ps < 0.03$ ). A similar effect was observed for the

general wellbeing facet  $F_{(3,242)} = 3.05$ ,  $p < 0.04$ ,  $\eta_p^2 = 0.04$ , but *post hoc* comparisons were not significant (see Table 5).

## DISCUSSION

With the aim of investigating the impact of dogs in the workplace to assess work-related and dog-related outcomes for employees who “never,” “sometimes,” and “often,” take their dog to work, we successfully conducted a large online survey. The majority of respondents were female, therefore the implications and conclusions should be considered with this in mind. We found that taking dogs to work was associated with better work related outcomes, including work engagement and commitment among dog owners. Dog weight (i.e., size), breed-type, and training may be important in considering what makes an ideal office dog. These are discussed in more detail below.

### Dogs in the Office: Work-Related and Dog-Related Outcomes

In general, employees who took their dog to work reported better work-related outcomes than those who “never” took their dog to work, on all work-related outcomes, with the exception of use of social media in break times; employees who “never” took their dog to the office used social media less than those who “often” took their dog. Those who “often” took their dog appeared to experience greater benefits from bringing their dog to work compared to those who “sometimes” take their dog to work, most notably in terms of work dedication (high levels of enthusiasm and pride in working), absorption (high levels of concentration in working), friendship acuity (better work-based friendships), vigor (energy, persistence, and effort in working), home-work interface (satisfaction in accommodating family and work commitments), control at work (perceived control over decisions), working conditions (high satisfaction with the physical working environment), and general wellbeing. Nonetheless, those that “sometimes” took their dog to work reported greater benefits than those who “never” took their dog to work, most notably in terms of work vigor and total work engagement, and satisfaction with home-work interface and working conditions. Those employees who “often” took their dog to work also realized the greatest benefits in terms of dog-related outcomes, reporting lower anxious pet attachment.

Previous literature has qualitatively identified that a concern over taking dogs in to the office is that they will cause a distraction to the working environment (38, 41). However, the quantitative data reported here do not seem to support this concern, with employees who take their dog to work reporting higher than average absorption to working, increased vigor and general work engagement. Furthermore, it appears that individuals who take their dog to work more frequently experience greater benefits than those who only “sometimes” take their dog to the office with them, particularly in terms of their reported dedication and absorption to work. This is congruent with research in the child development literature, which suggests that the presence of a friendly dog may increase motivation and attention to set tasks (8, 15, 61–63). Indeed, the biophilia hypothesis states that

**TABLE 5 |** Descriptive statistics for work related quality of life in employees who take their dog to their office as a function of dog-based demographics.

	General wellbeing	Home-work interface	Job-career satisfaction	Control at work	Working conditions	Stress at work	Overall work QoL
<b>Dog factors</b>	(Mean $\pm$ SEM)						
<b>Age</b>							
<6 months	3.25 $\pm$ 0.50	3.50 $\pm$ 0.60	4.00 $\pm$ 0.48	3.70 $\pm$ 0.58	4.35 $\pm$ 0.47	2.25 $\pm$ 0.73	3.50 $\pm$ 0.62
6 months–1 year	3.85 $\pm$ 0.15	4.04 $\pm$ 0.18	3.92 $\pm$ 0.14	4.20 $\pm$ 0.17	4.23 $\pm$ 0.14	3.11 $\pm$ 0.22	3.87 $\pm$ 0.18
1–2 years	3.75 $\pm$ 0.09	3.98 $\pm$ 0.11	3.97 $\pm$ 0.09	3.94 $\pm$ 0.10	4.20 $\pm$ 0.08	2.66 $\pm$ 0.13	4.08 $\pm$ 0.11
3–5 years	3.75 $\pm$ 0.08	3.99 $\pm$ 0.10	3.92 $\pm$ 0.08	3.85 $\pm$ 0.09	4.10 $\pm$ 0.08	2.72 $\pm$ 0.12	3.92 $\pm$ 0.10
6–8 years	3.80 $\pm$ 0.12	3.82 $\pm$ 0.15	3.89 $\pm$ 0.12	3.72 $\pm$ 0.14	4.01 $\pm$ 0.11	2.78 $\pm$ 0.18	3.94 $\pm$ 0.15
9–11 years	3.73 $\pm$ 0.12	3.73 $\pm$ 0.15	3.83 $\pm$ 0.12	3.93 $\pm$ 0.14	4.18 $\pm$ 0.11	2.77 $\pm$ 0.18	3.88 $\pm$ 0.15
12 years plus	3.85 $\pm$ 0.20	3.65 $\pm$ 0.24	3.80 $\pm$ 0.19	3.82 $\pm$ 0.23	4.02 $\pm$ 0.18	2.77 $\pm$ 0.29	3.92 $\pm$ 0.25
<b>Breed type</b>							
Single breed	3.72 $\pm$ 0.06	3.88 $\pm$ 0.07	3.91 $\pm$ 0.05	3.92 $\pm$ 0.06	4.12 $\pm$ 0.05	2.70 $\pm$ 0.08	3.91 $\pm$ 0.07
Single cross	3.76 $\pm$ 0.10	4.12 $\pm$ 0.12	3.99 $\pm$ 0.10	3.91 $\pm$ 0.12	4.16 $\pm$ 0.10	2.86 $\pm$ 0.15	4.06 $\pm$ 0.1
Mixed	3.95 $\pm$ 0.12	3.76 $\pm$ 0.14	3.80 $\pm$ 0.11	3.77 $\pm$ 0.14	4.17 $\pm$ 0.11	2.87 $\pm$ 0.17	3.97 $\pm$ 0.15
<b>Sex and neuter status</b>							
Female entire	3.88 $\pm$ 0.12	4.05 $\pm$ 0.15	4.09 $\pm$ 0.12	4.13 $\pm$ 0.14	4.29 $\pm$ 0.12	2.70 $\pm$ 0.18	3.94 $\pm$ 0.16
Female neutered	3.71 $\pm$ 0.08	3.83 $\pm$ 0.10	3.88 $\pm$ 0.08	3.84 $\pm$ 0.09	4.13 $\pm$ 0.08	2.71 $\pm$ 0.12	3.94 $\pm$ 0.10
Male entire	3.75 $\pm$ 0.10	3.95 $\pm$ 0.12	3.87 $\pm$ 0.10	3.99 $\pm$ 0.11	4.07 $\pm$ 0.09	2.74 $\pm$ 0.15	3.86 $\pm$ 0.12
Male neutered	3.78 $\pm$ 0.08	3.91 $\pm$ 0.09	3.90 $\pm$ 0.07	3.80 $\pm$ 0.09	4.12 $\pm$ 0.07	2.82 $\pm$ 0.11	4.02 $\pm$ 0.10
<b>Length owned</b>							
<6 months	3.91 $\pm$ 0.16	3.82 $\pm$ 0.20	3.97 $\pm$ 0.16	3.86 $\pm$ 0.19	4.15 $\pm$ 0.16	2.89 $\pm$ 0.24	4.11 $\pm$ 0.21
6 months–1 year	3.79 $\pm$ 0.12	3.93 $\pm$ 0.15	3.87 $\pm$ 0.12	3.97 $\pm$ 0.15	4.16 $\pm$ 0.12	2.97 $\pm$ 0.19	3.81 $\pm$ 0.16
1–2 years	3.69 $\pm$ 0.09	3.99 $\pm$ 0.11	3.92 $\pm$ 0.09	3.96 $\pm$ 0.11	4.19 $\pm$ 0.09	2.65 $\pm$ 0.14	4.04 $\pm$ 0.12
3–5 years	3.70 $\pm$ 0.08	3.98 $\pm$ 0.10	3.91 $\pm$ 0.08	3.79 $\pm$ 0.10	4.09 $\pm$ 0.08	2.70 $\pm$ 0.12	3.89 $\pm$ 0.10
6–8 years	3.85 $\pm$ 0.12	3.66 $\pm$ 0.15	3.86 $\pm$ 0.12	3.76 $\pm$ 0.14	3.97 $\pm$ 0.12	2.71 $\pm$ 0.18	3.79 $\pm$ 0.15
9–11 years	3.68 $\pm$ 0.14	3.77 $\pm$ 0.17	3.81 $\pm$ 0.14	4.01 $\pm$ 0.17	4.23 $\pm$ 0.14	2.69 $\pm$ 0.21	4.04 $\pm$ 0.18
12 years plus	4.35 $\pm$ 0.25	4.25 $\pm$ 0.30	4.39 $\pm$ 0.24	4.51 $\pm$ 0.29	4.41 $\pm$ 0.23	3.19 $\pm$ 0.37	4.50 $\pm$ 0.31
<b>Training</b>							
General obedience (GB)	3.83 $\pm$ 0.08	3.87 $\pm$ 0.09	3.97 $\pm$ 0.07	3.93 $\pm$ 0.09	4.17 $\pm$ 0.07	2.77 $\pm$ 0.11	4.04 $\pm$ 0.09
Kennel club (KC)	3.47 $\pm$ 0.23	3.84 $\pm$ 0.29	3.88 $\pm$ 0.22	3.77 $\pm$ 0.27	3.97 $\pm$ 0.22	2.61 $\pm$ 0.34	4.00 $\pm$ 0.29
Assistance dog (AD)	3.22 $\pm$ 0.28	3.82 $\pm$ 0.35	3.68 $\pm$ 0.27	3.33 $\pm$ 0.33	3.72 $\pm$ 0.27	2.92 $\pm$ 0.42	3.17 $\pm$ 0.35
Agility (Ag)	3.70 $\pm$ 0.70	3.70 $\pm$ 0.86	3.70 $\pm$ 0.67	4.30 $\pm$ 0.81	4.70 $\pm$ 0.66	2.00 $\pm$ 1.03	5.00 $\pm$ 0.86
Working dog (WD)	3.98 $\pm$ 0.25	4.29 $\pm$ 0.30	4.06 $\pm$ 0.24	4.09 $\pm$ 0.29	4.38 $\pm$ 0.23	2.69 $\pm$ 0.36	3.88 $\pm$ 0.31
Other	3.72 $\pm$ 0.28	3.57 $\pm$ 0.35	3.62 $\pm$ 0.27	3.55 $\pm$ 0.33	3.77 $\pm$ 0.27	2.67 $\pm$ 0.42	4.17 $\pm$ 0.35
None	3.71 $\pm$ 0.09	3.97 $\pm$ 0.11	3.83 $\pm$ 0.08	3.90 $\pm$ 0.10	4.14 $\pm$ 0.08	2.66 $\pm$ 0.13	3.89 $\pm$ 0.11
GB + KC + Ag	4.01 $\pm$ 0.26	4.33 $\pm$ 0.32	4.19 $\pm$ 0.25	3.86 $\pm$ 0.31	4.39 $\pm$ 0.25	3.21 $\pm$ 0.39	4.57 $\pm$ 0.33
GB + Ag	3.84 $\pm$ 0.16	3.81 $\pm$ 0.19	3.97 $\pm$ 0.15	3.99 $\pm$ 0.10	4.25 $\pm$ 0.15	2.98 $\pm$ 0.23	4.15 $\pm$ 0.19
GB + Ag + WD	3.43 $\pm$ 0.26	3.27 $\pm$ 0.32	3.44 $\pm$ 0.25	3.26 $\pm$ 0.31	3.77 $\pm$ 0.25	1.93 $\pm$ 0.39	3.43 $\pm$ 0.33
Gb + WD	4.13 $\pm$ 0.25	3.91 $\pm$ 0.30	3.89 $\pm$ 0.24	3.76 $\pm$ 0.29	3.88 $\pm$ 0.23	3.25 $\pm$ 0.36	3.75 $\pm$ 0.31
GB + KC	3.75 $\pm$ 0.20	4.12 $\pm$ 0.25	3.98 $\pm$ 0.19	4.12 $\pm$ 0.23	4.17 $\pm$ 0.19	3.00 $\pm$ 0.30	4.00 $\pm$ 0.25
AD + Other	3.56 $\pm$ 0.25	4.05 $\pm$ 0.30	4.10 $\pm$ 0.24	4.25 $\pm$ 0.29	4.09 $\pm$ 0.23	2.75 $\pm$ 0.36	3.38 $\pm$ 0.31
KC + Ag	3.80 $\pm$ 0.70	4.00 $\pm$ 0.86	4.50 $\pm$ 0.67	4.00 $\pm$ 0.81	5.00 $\pm$ 0.66	1.00 $\pm$ 1.03	4.00 $\pm$ 0.86
<b>Weight</b>							
<5kg	4.05 $\pm$ 0.16	4.19 $\pm$ 0.20	4.03 $\pm$ 0.16	4.11 $\pm$ 0.19	4.44 $\pm$ 0.15	2.67 $\pm$ 0.24	4.39 $\pm$ 0.20
6–10 kg	3.72 $\pm$ 0.10	4.00 $\pm$ 0.12	3.98 $\pm$ 0.10	4.04 $\pm$ 0.12	4.23 $\pm$ 0.09	2.72 $\pm$ 0.15	4.06 $\pm$ 0.12
11–20 kg	3.87 $\pm$ 0.07	3.77 $\pm$ 0.09	3.94 $\pm$ 0.07	3.91 $\pm$ 0.09	4.19 $\pm$ 0.07	2.76 $\pm$ 0.11	4.02 $\pm$ 0.09
21 kg plus	3.62 $\pm$ 0.07	3.95 $\pm$ 0.09	3.81 $\pm$ 0.07	3.76 $\pm$ 0.09	3.97 $\pm$ 0.07	2.78 $\pm$ 0.11	3.73 $\pm$ 0.09

humans have evolved to increase attentional processes in the presence of animals (64), and while this has been thought to underlie, at least in part, some of the benefits associated with

the human-animal bond and AAI (20, 65), its relevance to work-related attention in an environment that includes dogs has not been considered before.

Employees who “often” take their dog to work also reported significantly lower intention to leave their place of current employment than those who “sometimes” and “never” take their dog to work, suggesting that taking dogs regularly to the office increases long-term job commitment as well as short-term engagement with the job. The costs of staff turnover represents a considerable strain for businesses, with estimates suggesting just one departing employee can cost \$48,000–121,000, by the time hiring costs and loss of productivity have been taken into account (66, 67). Therefore, encouraging employees to regularly take their dog to the office may not only increase productivity on a day-to-day basis, but also help to ensure the longevity of the workforce. This may be particularly important to consider in certain workplaces such as the UK National Health Service (NHS) with its rapidly depleting workforce (68), provided any health risk can be properly managed.

Employee engagement and commitment may be a direct effect associated with having their pet dog with them at work, but it may also, in part, be the product of having a higher perceived work quality of life. Previous studies have suggested that the presence of a friendly pet dog can reduce both perceived stress and physiological reactions associated with stress during a complex mental task, similar to that which may be experienced in an office environment (28, 69–71). Since work-based stress impacts on employee performance (44, 72), is associated with motivations to leave current place of employment (73, 74), and has implications for general health (75–77), reducing stress, and increasing general work quality of life may enable employees to reach and sustain optimal performance. However, given that scores on the “stress at work” sub-scale were not significantly different between the groups it appears that allowing dogs in the office may bring more indirect stress reducing benefits, in terms of improving perceptions of home-work interface, control at work and working conditions. These latter two points support previous research which suggests that dogs in the office improve the general atmosphere and working environment (41, 46); nonetheless, concerns that dogs reduce the quality of working conditions due to health and safety concerns or by diminishing perceptions of professionalism (39, 41) persist despite a lack of evidence to support this supposition.

We found that employees who “often” take their dog to work reported lower anxious attachment to their dog than those who “never” and “sometimes” took their dog to work. Since owners report stress at the thought of leaving their dog unattended at home whilst they visit the office (43), it may be that allowing dogs in the office reduces this anxiety, strengthening the owner-dog bond, and contributing to general feelings of increased wellbeing and quality of life.

Another psychological mechanism which may partly underlie the beneficial work-based outcomes observed here is that employees may experience greater social support when they take their dog to the office. Not only may the dog itself act as a source of companionship and ontological security (78, 79), but the presence of a dog has also been shown to increase social interactions between individuals (21, 80). Here, we observed that employees who “often” and “sometimes” took their dog to work scored high on friendship acuity within the office, whereas

individuals who “never” took their dog to work scored average, being significantly lower than employees in the “often” group. This supports previous studies which suggest that a perceived benefit of allowing dogs in the office is increased social interaction (39, 41, 46, 81). Since social support is related to stress, quality of life and working performance (82–84), increasing feelings of support are likely to bring a range of work-related benefits. Interestingly, and conversely to what was expected, we identified that employees who “never” took their dog to the office used social media less during break times than employees who “often” took their dog to the office. This difference was only significant at break times, not during work hours, or when at home, suggesting that this effect may be unique to social interactions at work, rather than in general. It is not possible to determine whether the use of social media in the work-place during working hours has a positive or negative influence on employees’ work and commitment. Potential positive benefits include social media providing an effective and time-efficient mechanism to connect with colleagues, which may help minimize the impact that maintaining work-based friendships has on job performance (85, 86). There is research to indicate that employees use social media to increase respect and likeability among colleagues through posting self-enhancing messages (87). From this perspective increased use of social media may help strengthen work-based friendships and improve job satisfaction. However, the regular use of social may also have potentially negative impacts on health and wellbeing (36, 88), with reduced performance reported for some work-based tasks (89), although the current study does not support this in relation to dog owners.

Previous studies have identified animal health and welfare issues as a reason for not allowing dogs in the office (41, 46). In the present study, based on an owner self-report scale, we found no evidence to support this concern, with employees across the three dogs at work reporting similar dog health. However, we believe it is important that, in both research and practice, the implications to dog health continues to be assessed in the future. Although the simple single Likert-scale rated item used in this study is useful for providing a basic assessment, more independent and rigorous tests should be used, as assessed by clinicians using a range of techniques including examination of historical reports, behavioral observation, and physiological measures.

## Dog Demographics: The Impact on Work-Related Outcomes

With the secondary aim of identifying whether certain dogs make better working companions than others, we assessed if certain dog based demographics were related to better work-related outcomes than others.

When employers are developing dogs-in-the-workplace policies an important factor to consider may be dog size. Based on these self-report findings, it appears that larger dogs may reduce total work engagement and more specifically absorption with work, compared to smaller dogs. Similarly, allowing smaller dogs in the office may bring greater improvements to work-related quality of life. Given this effect was noticed with working



conditions, which includes questions such as “I work in a safe environment” and “the working conditions are satisfactory,” it may be that bigger dogs in the office create a perception of greater hazard and reduced office space which impinges on working conditions. Employers could consider revising office layouts where possible to reduce the potentially negative effects of having larger dogs in the office. However, based on the results presented here, we cannot rule out that these effects are purely explained by dog size. Results of a meta-analysis suggest that employee personality plays a substantial role in determining work engagement, in particular; positive affectivity, proactivity, conscientiousness, and extraversion (90). Since we did not assess, or control for, the influence of personality it may be that individuals with these traits are over represented in the small dog owner group.

We also identified that dog breed may be important to consider, with employees who owned mixed breed dogs in the office using less social media during break times. However, since the implications of use of social media in this study are not clear, it is uncertain at this point whether reduced use of social media brings positive effects, in terms of increasing social interaction and reducing depression, or negative effects, such as increasing the potentially negative impact of managing friendships on work productivity. Again it is not possible to decipher whether it is the unique characteristics of the dogs, or the owners that choose to have a mixed breed dog, which reduces social media use.

A final factor to consider is dog training. Individuals whose dog had received general obedience training combined with agility training and working dog training showed higher turnover intention than those whose dogs had received general obedience training, agility training and Kennel Club training. However, the number of employees in these two groups is quite small and this may reflect other specific attributes of this group rather than purely the impact of dog training. Additionally, comparison of employees whose dogs had received just Kennel Club and working dog training were not statistically significant, suggesting there is nothing specific about these two types of training which impacts on employee turnover intention.

Although we are not able to conclusively determine the causal nature and implications of these results, we have identified that dog size, breed and training represent important factors to consider in the future and pursuing research in this area may be important if we are to develop potentially economically valuable policies.

## Characteristics of the Sample and Their Associations With Taking Your Dog to Work

Three office-based characteristics were associated with the extent to which employees took their dog to work “never,” “sometimes,” or “often”; type of organization, length of time in current employment and number of people in the office. These results suggest that working for a not-for-profit organization was associated with more employees taking their dog to work more frequently and working in the education sector was associated with taking your dog to work less frequently. This perhaps reflects that in the education sector it is considered a greater risk to

health and safety to have a dog in a classroom-type environment, where there may be large numbers of young children, or more vulnerable individuals. However, there is a literature to indicate the potential promise of using dogs in educational settings, to improve behavior, literacy, memory and categorization tasks (9, 15, 91, 92). Therefore, it may be valuable to consider ways to address how to implement dogs in the classroom, whilst safeguarding both child and animal. Given that the categories used to define “type of organization” were broad, future research should consider using more refined categories.

The second factor to consider here is length of time in current employment, with employees who had been employed for longer bringing their dog to work more frequently. However, it is not clear whether this reflects an organization’s willingness to allow employees who have been there longer to bring their dog to work with them, or whether being allowed to bring your dog to work influences commitment to the organization.

The third factor associated with regularly bringing your dog to work was small offices (fewer employees). This may be because it is easier to implement dogs in the workplace policies when office numbers are small, due to space restrictions and monitoring for employee allergies/fears and phobias. One dog-based factor was associated with the frequency in which dogs were taken to work—dog training. More employees who “often” took their dog to work had a dog who had received assistance dog ( $n = 5$ ) or working dog training ( $n = 7$ ) (e.g., herding or gun dog training). It is plausible that dogs who have received this arguably more intensive training were more likely to pass any organizational assessments to be allowed into the office, or that their owner or employer believed these dogs possessed the characteristics that were needed to make a successful office dog. However, since we did not assess these factors it is not possible to confirm these speculations at present.

## Study Limitations and Future Research

The majority of our respondents were female. Whilst females were represented similarly across the three dog at work groups, and therefore should not bias the results, it should be noted that our conclusions are drawn from a primarily female sample. Previous research exploring the impact of dogs in the workplace are also based on a predominantly female sample (28, 39, 42), or gender bias is not recorded (40). Studies in other fields of research also report a strong female gender bias in response rates (93, 94), suggesting this is not unique to the current topic. Future research should employ strategies to actively engage more male responders, including the targeting of male-dominated offices or sports and social clubs.

Although this study represents the largest (known) investigation to date into the impact of dogs in the office on work-related and dog-related outcomes, achieving our relatively large sample size was facilitated through the use of self-report data using, where possible, validated scales of assessment. This leaves open the possibility of a self-report bias in data collection. To help mitigate the potential pitfall with this approach, respondents were assured all responses would remain confidential and no personal identifying information was collected, however, it is still plausible that respondents felt uncomfortable answering the



questions, perhaps particularly relating to turnover intention, with full honesty. Nonetheless, even if this did bias responses to a degree, we still observed significant differences between the groups. Future research should focus on collecting additional, arguably more objective, measures of work-related outcomes in offices where employees do and do not take their dog to work. Such measures should include staff retention/turnover and sick days. Sick leave represents a substantial cost to all businesses; the greatest contributing factor to the cost of mental health illnesses such as depression, is loss of work productivity from both absenteeism and presenteeism (working whilst dealing with depression), collectively estimated to cost around \$250 billion/year across eight countries, (4). Other estimates, taking into account broader aspects of loss (not unique to business productivity), show that in 2010 the worldwide cost of mental health issues were estimated at \$2.5–8.5 trillion (6) and this is likely to have increased significantly since then and can be expected to continue to do so (95). Since dog companionship may offer some protection against depression (96–99), there is a strong argument for investigating whether allowing dogs in the workplace reduces both absenteeism and presenteeism due to depression. Work absence due to pet care issues and its impact should also be considered.

## CONCLUSION

The results add to the growing body of work that indicates the potential benefits of encouraging owners to take their dogs to work, highlighting their value in employee engagement and commitment to work, work-related quality of life and work-based friendships, in our predominantly female sample. However, we wish to stress that it is likely that the potential benefits of allowing dogs in the office will only be maximized through the implementation of well-designed policies, which have been developed with the input from multi-disciplinary teams incorporating organizational psychologists and animal behaviorists. Previous research by Hall et al. (41) may prove a useful starting point in the development of such policies. We report, for the first time, some of the potential dog-based factors

which may be important to consider in the development of these policies, notably dog size and dog breed-type. Nonetheless, future research is required to substantiate the relative importance of these factors.

## DATA AVAILABILITY

All datasets generated for this study are included in the manuscript and/or the supplementary files.

## ETHICS STATEMENT

The study was carried out in accordance with the recommendations of the British Psychological Society (BPS) Ethical Code of Conduct, with written informed consent from all subjects. All subjects gave written informed consent in accordance with the Declaration of Helsinki. The protocol was approved by the University of Lincoln's College of Science Research Ethics Committee (ID: CoSREC367).

## AUTHOR CONTRIBUTIONS

SH was responsible for co-designing the study, data collection, analysis, interpretation and manuscript preparation. DM was responsible for co-designing the study, statistical support, data interpretation and manuscript preparation.

## FUNDING

This research was supported by a grant awarded to SH and DM by Nestlé Purina Human Animal Bond Studies, the grant facilitated staff resources to carry out the project. The funders were not involved in study conception, design or analysis.

## ACKNOWLEDGMENTS

The authors thank Dr. Lauren Finka for her support with statistical advice.

## REFERENCES

1. Cunha MPE, Rego A, Munro I. Dogs in organizations. *Hum Relat.* (2018) 72:778–800. doi: 10.1177/0018726718780210
2. Hunter C, Verreynne M-L, Pachana N, Harpur P. The impact of disability-assistance animals on the psychological health of workplaces: a systematic review. *Hum Res Manage Rev.* (2018). doi: 10.1016/j.hrmr.2018.07.007. [Epub ahead of print].
3. Edmans A, Li L, Zhang C. Employee satisfaction, labor market flexibility, and stock returns around the world. In: *National Bureau of Economic Research*. London (2014). doi: 10.3386/w20300
4. Evans-Lacko S, Knapp M. *Cost of Depression in the Workplace Across Eight Diverse Countries-Collectively US \$250 Billion*. London: LSE Health and Social Care (2016).
5. Norling AY. *Dogs in the Office Environment-A Behavioural Study*. (2008) Sweden: Swedish University of Agricultural Sciences, Student report 183.
6. Bloom DE, Cafiero E, Jané-Llopis E, Abrahams-Gessel S, Bloom LR, Fathima S, et al. The global economic burden of noncommunicable diseases. In: *Program on the Global Demography of Aging*. London (2012). <https://ideas.repec.org/p/gdm/wpaper/8712.html>
7. Sharpe D. Your chi-square test is statistically significant: now what? *Pract Assess Res Evalu.* (2015). 20:1–10. <https://pareonline.net/getvn.asp?v=20&n=8>
8. Gee NR, Griffin JA, McCardle P. Human-animal interaction research in school settings: current knowledge and future directions. *AERA Open.* (2017) 3:1–9. doi: 10.1177/2332858417724346
9. Brelsford VL, Meints K, Gee NR, Pfeffer K. Animal-assisted interventions in the classroom—a systematic review. *Int. J. Environ. Res. Public Health.* (2017) 14:669. doi: 10.3390/ijerph14070669
10. Majić T, Gutzmann H, Heinz A, Lang UE, Rapp MA. Animal-assisted therapy and agitation and depression in nursing home residents with dementia: a matched case-control trial. *Am J Geriatr Psychiatry.* (2013) 21:1052–9. doi: 10.1016/j.jagp.2013.03.004
11. Schuurmans L, Enders-Slegers M-J, Verheggen T, Schols J. Animal-assisted interventions in Dutch nursing homes: a survey. *J Am Med Dir Assoc.* (2016) 17:647–53. doi: 10.1016/j.jamda.2016.03.015
12. Chur-Hansen A, McArthur M, Winefield H, Hanieh E, Hazel S. Animal-assisted interventions in children's hospitals: a critical review of the literature. *Anthrozoös.* (2014) 27:5–18. doi: 10.2752/175303714X13837396326251

13. Creagan ET, Bauer BA, Thomley BS, Borg JM. Animal-assisted therapy at Mayo clinic: the time is now. *Complement Ther Clin Pract.* (2015) 21:101–4. doi: 10.1016/j.ctcp.2015.03.002
14. Calvo P, Fortuny JR, Guzmán S, Macías C, Bowen J, García ML, et al. Animal assisted therapy (AAT) program as a useful adjunct to conventional psychosocial rehabilitation for patients with schizophrenia: results of a small-scale randomized controlled trial. *Front Psychol.* (2016) 7:631. doi: 10.3389/fpsyg.2016.00631
15. Hall SS, Gee NR, Mills DS. Children reading to dogs: a systematic review of the literature. *PLoS ONE.* (2016) 11:e0149759. doi: 10.1371/journal.pone.0149759
16. Smith BP, Dale AA. Integrating animals in the classroom: the attitudes and experiences of Australian school teachers toward animal-assisted interventions for children with autism spectrum disorder. *Pet Behav Sci.* 1:13–22. doi: 10.21071/pbs.v0i1.3994
17. Zents CE, Fisk AK, Lauback CW. Paws for intervention: perceptions about the use of dogs in schools. *J Creat Mental Health.* (2017) 12:82–98. doi: 10.1080/15401383.2016.1189371
18. Wiggott-Barnard C, Steel H. The experience of owning a guide dog. *Disabil Rehabil.* (2008) 30:1014–26. doi: 10.1080/09638280701466517
19. Audrestsch HM, Whelan CT, Grice D, Asher L, England GC, Freeman SL. Recognizing the value of assistance dogs in society. *Disabil Health J.* (2015) 8:469–74. doi: 10.1016/j.dhjo.2015.07.001
20. Mills D, Hall S. Animal-assisted interventions: making better use of the human-animal bond. *Veterinary Record.* (2014) 174:269–73. doi: 10.1136/vr.g1929
21. Wood L, Martin K, Christian H, Nathan A, Lauritsen C, Houghton S, et al. The pet factor-companion animals as a conduit for getting to know people, friendship formation and social support. *PLoS ONE.* (2015) 10:e0122085. doi: 10.1371/journal.pone.0122085
22. Wright H, Hall S, Hames A, Hardiman J, Mills R, Mills D, et al. Acquiring a pet dog significantly reduces stress of primary carers for children with autism spectrum disorder: a prospective case control study. *J Autism Dev Disord.* (2015) 45:2531–40. doi: 10.1007/s10803-015-2418-5
23. Hall SS, Wright HF, Hames A, Mills DS. The long-term benefits of dog ownership in families with children with autism. *J Vet Behav Clin Appl Res.* (2016) 13:46–54. doi: 10.1016/j.jveb.2016.04.003
24. Kertes DA, Liu J, Hall NJ, Hadad NA, Wynne CD, Bhatt SS. Effect of pet dogs on children's perceived stress and cortisol stress response. *Soc Dev.* (2017) 26:382–401. doi: 10.1111/sode.12203
25. PetSitters. *Take Your Dog to Work Day [Online]*. (2018). Available online at: <https://www.petsit.com/take-your-dog-to-work-day-history> (accessed February 6, 2019).
26. Purina. *Pets at Work [Online]*. (2018). Available online at: <https://www.purina.co.uk/pins/pets-at-work> (accessed February 5, 2019).
27. Allen KM, Blascovich J, Tomaka J, Kelsey RM. Presence of human friends and pet dogs as moderators of autonomic responses to stress in women. *J Pers Soc Psychol.* (1991) 61:582–9. doi: 10.1037/0022-3514.61.4.582
28. Barker RT, Knisely JS, Barker SB, Cobb RK, Schubert CM. Preliminary investigation of employee's dog presence on stress and organizational perceptions. *Int J Workplace Health Manage.* (2012) 5:15–30. doi: 10.1108/17538351211215366
29. Walsh D, Yamamoto M, Willits NH, Hart LA. Job-related stress in forensic interviewers of children with use of therapy dogs compared with facility dogs or no dogs. *Front Vet Sci.* (2018) 5:46. doi: 10.3389/fvets.2018.00046
30. Beetz A, Kotrschal K, Turner DC, Hediger K, Uvnäs-Moberg K, Julius H. The effect of a real dog, toy dog and friendly person on insecurely attached children during a stressful task: an exploratory study. *Anthrozoos.* (2011) 24:349–68. doi: 10.2752/175303711X13159027359746
31. Beetz A, Julius H, Turner D, Kotrschal K. Effects of social support by a dog on stress modulation in male children with insecure attachment. *Front Psychol.* (2012) 3:352. doi: 10.3389/fpsyg.2012.00352
32. McNicholas J, Collis GM. Dogs as catalysts for social interactions: robustness of the effect. *Br J Psychol.* (2000) 91:61–70. doi: 10.1348/000712600161673
33. Townsend K, Wilkinson A, Burgess J. Routes to partial success: collaborative employment relations and employee engagement. *Int J Hum Resour Manage.* (2014) 25:915–30. doi: 10.1080/09585192.2012.743478
34. Olsen KM, Sverdrup T, Nesheim T, Kalleberg AL. Multiple foci of commitment in a professional service firm: balancing complex employment relations. *Hum Resour Manage J.* (2016) 26:390–407. doi: 10.1111/1748-8583.12109
35. Easton S, Van Laar D. QoWL (Quality of Working Life): what, how, and why? *Psychol Res.* (2013) 3:596–605. doi: 10.17265/2159-5542/2013.10.006
36. Jelenchick LA, Eickhoff JC, Moreno MA. Facebook depression? Social networking site use and depression in older adolescents. *J Adolesc Health.* (2013) 52:128–30. doi: 10.1016/j.jadohealth.2012.05.008
37. Bleas C. Too many 'friends', too few 'likes'? Evolutionary psychology and 'Facebook depression'. *Rev General Psychol.* (2015) 19:1–13. doi: 10.1037/gpr0000030
38. Wells M, Perrine R. Critters in the cube farm: perceived psychological and organizational effects of pets in the workplace. *J Occup Health Psychol.* (2001) 6:81–7. doi: 10.1037/1076-8998.6.1.81
39. Perrine RM, Wells M. Labradors to Persians: perceptions of pets in the workplace. *Anthrozoös.* (2006) 19:65–78. doi: 10.2752/089279306785593928
40. Norling A-Y, Keeling L. Owning a dog and working: a telephone survey of dog owners and employers in Sweden. *Anthrozoös.* (2010) 23:157–71. doi: 10.2752/175303710X12682332910015
41. Hall S, Wright H, McCune S, Zulch H, Mills D. Perceptions of dogs in the workplace: the pros and the cons. *Anthrozoös.* (2017) 30:291–305. doi: 10.1080/08927936.2017.1311053
42. Colarelli SM, McDonald AM, Christensen MS, Honts C. A companion dog increases prosocial behavior in work groups. *Anthrozoös.* (2017) 30:77–89. doi: 10.1080/08927936.2017.1270595
43. Westgarth C, Pinchbeck GL, Bradshaw JW, Dawson S, Gaskell RM, Christley RM. Factors associated with dog ownership and contact with dogs in a UK community. *BMC Vet Res.* (2007) 3:5. doi: 10.1186/1746-6148-3-5
44. LePine JA, Podsakoff NP, LePine MA. A meta-analytic test of the challenge stressor-hindrance stressor framework: an explanation for inconsistent relationships among stressors and performance. *Acad Manage J.* (2005) 48:764–75. doi: 10.5465/amj.2005.18803921
45. Colligan TW, Higgins EM. Workplace stress: etiology and consequences. *J Workplace Behav Health.* (2006) 21:89–97. doi: 10.1300/J490v21n02\_07
46. Foreman A, Glenn M, Meade B, Wirth O. Dogs in the workplace: a review of the benefits and potential challenges. *Int J Environ Res Public Health.* (2017) 14:498. doi: 10.3390/ijerph14050498
47. Easton S, Van Laar D. *User Manual for the Work-Related Quality of Life (WRQoL) Scale: A Measure of Quality of Working Life*. University of Portsmouth (2018).
48. Van Laar D, Edwards JA, Easton S. The work-related quality of life scale for healthcare workers. *J Adv Nurs.* (2007) 60:325–33. doi: 10.1111/j.1365-2648.2007.04409.x
49. Edwards JA, Van Laar D, Easton S, Kinman G. The work-related quality of life scale for higher education employees. *Q High Educ.* (2009) 15:207–19. doi: 10.1080/13538320903343057
50. Schaufeli WB, Salanova M, González-Romá V, Bakker AB. The measurement of engagement and burnout: a two sample confirmatory factor analytic approach. *J Happiness Stud.* (2002) 3:71–92. doi: 10.1023/A:1015630930326
51. Schaufeli WB, Bakker AB. *Utrecht Work Engagement Scale: Preliminary Manual, Vol. 26*. Occupational Health Psychology Unit, Utrecht University, Utrecht (2003).
52. Schaufeli WB, Bakker AB, Salanova M. The measurement of work engagement with a short questionnaire: a cross-national study. *Educ Psychol Meas.* (2006) 66:701–16. doi: 10.1177/0013164405282471
53. Seppälä P, Mauno S, Feldt T, Hakanen J, Kinnunen U, Tolvanen A, et al. The construct validity of the Utrecht work engagement scale: Multisample and longitudinal evidence. *J Happiness Stud.* (2009) 10:459. doi: 10.1007/s10902-008-9100-y
54. Bothma CF, Roodt G. The validation of the turnover intention scale. *SA J Hum Resour Manage.* (2013) 11:1–12. doi: 10.4102/sajhrm.v11i1.507

55. Du Plooy J, Roodt G. Work engagement, burnout and related constructs as predictors of turnover intentions. *SA J Industr Psychol.* (2010) 36:1–13. doi: 10.4102/sajip.v36i1.910
56. Hawthorne G. Measuring social isolation in older adults: development and initial validation of the friendship scale. *Soc Indic Res.* (2006) 77:521–48. doi: 10.1007/s11205-005-7746-y
57. Kent P, Hawthorne G, Kjaer P, Manniche C, Albert HB. A Danish version of the friendship scale: translation and validation of a brief measure of social isolation. *Soc Indic Res.* (2015) 120:181–95. doi: 10.1007/s11205-014-0576-z
58. Zilcha-Mano S, Mikulincer M, Shaver PR. An attachment perspective on human-pet relationships: conceptualization and assessment of pet attachment orientations. *J Res Pers.* (2011) 45:345–57. doi: 10.1016/j.jrp.2011.04.001
59. Schaufeli WB, Bakker AB. Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *J Organ Behav.* (2004) 25:293–315.
60. Easton S, Van Laar DL. *User Manual of the Work-Related Quality of Life Scale (WRQoL)*. Portsmouth: University of Portsmouth (2012).
61. Gee NR, Harris SL, Johnson KL. The role of therapy dogs in speed and accuracy to complete motor skills tasks for preschool children. *Anthrozoös.* (2007) 20:375–86. doi: 10.2752/089279307X245509
62. Gee NR, Sherlock TR, Bennett EA, Harris SL. Preschoolers' adherence to instructions as a function of presence of a dog and motor skills task. *Anthrozoös.* (2009) 22:267–76. doi: 10.2752/175303709X457603
63. Gee NR, Crist EN, Carr DN. Preschool children require fewer instructional prompts to perform a memory task in the presence of a dog. *Anthrozoös.* (2010) 23:173–84. doi: 10.2752/175303710X12682332910051
64. Wilson EO. *Biophilia: The Human Bond With Other Species*. Cambridge: Harvard University Press (1984).
65. Joye Y. Biophilia in animal-assisted interventions-fad or fact? *Anthrozoös.* (2011) 24:5–15. doi: 10.2752/175303711X12923300467249
66. Roche MA, Duffield CM, Homer C, Buchan J, Dimitrelis S. The rate and cost of nurse turnover in Australia. *Collegian.* (2015) 22:353–8. doi: 10.1016/j.colegn.2014.05.002
67. Economist T. (2018). *The High Costs of Staff Turnover: Workers are Loosing Their Chains* [Online]. The Economist. Available online at: <https://www.economist.com/business/2018/09/20/the-high-costs-of-staff-turnover> (accessed February 6, 2019).
68. NHS. *The NHS Long Term Plan* [Online]. (2019). Available online at: <https://www.longtermplan.nhs.uk/publication/nhs-long-term-plan/> (accessed February 6, 2019).
69. Barker SB, Knisely JS, McCain NL, Schubert CM, Pandurangi AK. Exploratory study of stress-buffering response patterns from interaction with a therapy dog. *Anthrozoös.* (2010) 23:79–91. doi: 10.2752/175303710X12627079939341
70. Barker SB, Barker RT, McCain NL, Schubert CM. A randomized cross-over exploratory study of the effect of visiting therapy dogs on college student stress before final exams. *Anthrozoös.* (2016) 29:35–46. doi: 10.1080/08927936.2015.1069988
71. Gee NR, Friedmann E. Companion animals as moderators of stress responses: implications for academic performance, testing, and achievement. In: *How Animals Help Students Learn*. Routledge (2017). p. 120–32. doi: 10.4324/9781315620619
72. Lamb S, Kwok KC. A longitudinal investigation of work environment stressors on the performance and wellbeing of office workers. *Appl Ergon.* (2016) 52:104–11. doi: 10.1016/j.apergo.2015.07.010
73. Boamah SA, Laschinger H. The influence of areas of worklife fit and work-life interference on burnout and turnover intentions among new graduate nurses. *J Nurs Manag.* (2016) 24:E164–74. doi: 10.1111/jonm.12318
74. Lee BK, Seo DK, Lee JT, Lee AR, Jeon HN, Han DU. (2016). Impact of work environment and work-related stress on turnover intention in physical therapists. *J Phys Ther Sci.* 28, 2358–2361. doi: 10.1589/jpts.28.2358
75. Khamisa N, Oldenburg B, Peltzer K, Ilic D. Work related stress, burnout, job satisfaction and general health of nurses. *Int J Environ Res Public Health.* (2015) 12:652–66. doi: 10.3390/ijerph120100652
76. Siegrist J, Li J. Associations of extrinsic and intrinsic components of work stress with health: a systematic review of evidence on the effort-reward imbalance model. *Int J Environ Res Public Health.* (2016) 13:432. doi: 10.3390/ijerph13040432
77. Bliese PD, Edwards JR, Sonnentag S. Stress and well-being at work: a century of empirical trends reflecting theoretical and societal influences. *J Appl Psychol.* (2017) 102:389–402. doi: 10.1037/apl0000109
78. Brooks H, Rushton K, Walker S, Lovell K, Rogers A. Ontological security and connectivity provided by pets: a study in the self-management of the everyday lives of people diagnosed with a long-term mental health condition. *BMC Psychiatry.* (2016) 16:409. doi: 10.1186/s12888-016-1111-3
79. Veevers JE. The social meanings of pets: alternative roles for companion animals. In: *Pets and the Family*. Routledge (2016). p. 11–30. doi: 10.4324/9781315784656-3
80. Wood L, Martin K, Christian H, Houghton S, Kawachi I, Vallesi S, et al. Social capital and pet ownership-A tale of four cities. *SSM Population Health.* (2017) 3:442–7. doi: 10.1016/j.ssmph.2017.05.002
81. Wilkin CL, Fairlie P, Ezzedeen SR. Who let the dogs in? A look at pet-friendly workplaces. *Int J Workplace Health Manage.* (2016) 9:96–109. doi: 10.1108/IJWHM-04-2015-0021
82. AbuAIRub RF. Job stress, job performance, and social support among hospital nurses. *J Nursing Scholarship.* (2004) 36:73–8. doi: 10.1111/j.1547-5069.2004.04016.x
83. Wallace JC, Edwards BD, Arnold T, Frazier ML, Finch DM. Work stressors, role-based performance, and the moderating influence of organizational support. *J Appl Psychol.* (2009) 94:254–62. doi: 10.1037/a0013090
84. Kim HJ, Hur W-M, Moon T-W, Jun J-K. Is all support equal? The moderating effects of supervisor, coworker, and organizational support on the link between emotional labor and job performance. *BRQ Bus Res Q.* (2017) 20:124–36. doi: 10.1016/j.brq.2016.11.002
85. Methot JR, LePine JA. Too close for comfort? Investigating the nature and functioning of work and non-work role segmentation preferences. *J Bus Psychol.* (2016) 31:103–23. doi: 10.1007/s10869-015-9402-0
86. Methot JR, Lepine JA, Podsakoff NP, Christian JS. Are workplace friendships a mixed blessing? Exploring tradeoffs of multiplex relationships and their associations with job performance. *Pers Psychol.* (2016) 69:311–55. doi: 10.1111/peps.12109
87. Batenburg A, Bartels J. Keeping up online appearances: how self-disclosure on Facebook affects perceived respect and likability in the professional context. *Comput Human Behav.* (2017) 74:265–76. doi: 10.1016/j.chb.2017.04.033
88. Shakyia HB, Christakis NA. Association of Facebook use with compromised well-being: a longitudinal study. *Am J Epidemiol.* (2017) 185:203–11. doi: 10.1093/aje/kww189
89. Junco R. Too much face and not enough books: the relationship between multiple indices of Facebook use and academic performance. *Comput Human Behav.* (2012) 28:187–98. doi: 10.1016/j.chb.2011.08.026
90. Young HR, Glerum DR, Wang W, Joseph DL. Who are the most engaged at work? A meta-analysis of personality and employee engagement. *J Organ Behav.* (2018) 39:1330–46. doi: 10.1002/job.2303
91. Kotrschal K, Ortbauer B. Behavioral effects of the presence of a dog in a classroom. *Anthrozoös.* (2003) 16:147–59. doi: 10.2752/089279303786992170
92. Anderson KL, Olson MR. The value of a dog in a classroom of children with severe emotional disorders. *Anthrozoös.* (2006) 19:35–49. doi: 10.2752/089279306785593919
93. Cull WL, O'Connor KG, Sharp S, Tang SF. (2005). Response rates and response bias for 50 surveys of pediatricians. *Health Serv. Res.* 40:213–26. doi: 10.1111/j.1475-6773.2005.00350.x
94. Slauson-Blevins K, and Johnson KM. Doing gender, doing surveys? Women's gatekeeping and men's non-participation in multi-actor reproductive surveys. *Soc Inquiry.* (2016) 86:427–49. doi: 10.1111/soin.12122
95. Chisholm D, Sweeny K, Sheehan P, Rasmussen B, Smit F, Cuijpers P, et al. Scaling-up treatment of depression and anxiety: a global return on investment analysis. *Lancet Psychiatry.* (2016) 3:415–24. doi: 10.1016/S2215-0366(16)30024-4
96. Souter MA, Miller MD. Do animal-assisted activities effectively treat depression? A meta-analysis. *Anthrozoös.* (2007) 20:167–80. doi: 10.2752/175303707X207954

97. Lem M, Coe JB, Haley DB, Stone E, O'Grady W. The protective association between pet ownership and depression among street-involved youth: a cross-sectional study. *Anthrozoös*. (2016) 29:123–36. doi: 10.1080/08927936.2015.1082772
98. Muldoon AL, Kuhns LM, Supple J, Jacobson KC, Garofalo R. A web-based study of dog ownership and depression among people living with HIV. *JMIR Mental Health*. (2017) 4:e53. doi: 10.2196/mental.8180
99. Ricciardelli M, Henner K, McDade K. Effects of dogs on depression levels of cancer patients. *Am J Occup Ther*. (2017) 71(4\_Supplement\_1): 7111520298p7111520291. doi: 10.5014/ajot.2017.71S1-PO5053

**Conflict of Interest Statement:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2019 Hall and Mills. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.